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2004/00162

*Setifikaat*

PATENTKANTOOR

DEPARTMENT VAN HANDERL  
NYWERHEID



*Certificate*

PATENT OFFICE

DEPARTMENT OF TRADE  
AND INDUSTRY

Hiermee word gesetifiseer dat  
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2004/00162

The attached documents are true copies of the Form P2, P1, P6 and a Provisional Specification of a South African Patent application No. 2004/01930

In the name of : **JAN PETRUS HUMAN**

Filed on the : **10<sup>th</sup> March 2004**

Entitled : **TAMPER EVIDENT CLOSURE**

Getekken te

**PRETORIA**

Signed at

in die Republiek van Suid-Afrika, hierdie

in the Republic of South Africa, this

20<sup>th</sup>

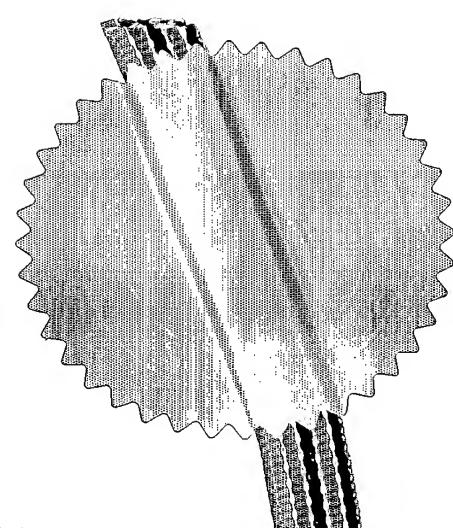
dag van

**DECEMBER 2006**

day of

A handwritten signature in black ink, appearing to read 'J. D. G. S. 2006'.

Registrateur van Patente  
Registrar of Patents



REPUBLIC OF SOUTH AFRICA

REGISTER OF PATENTS

OFFICIAL APPLICATION NO.		LODGING DATE: PROVISIONAL		ACCEPTANCE DATE	
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INTERNATIONAL CLASSIFICATION		LODGING DATE: COMPLETE		GRANT DATE	
51		23		47	
FULL NAME(S) OF APPLICANT(S) / PATENTEE(S)					
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APPLICANTS SUBSTITUTED		DATE REGISTERED			
71					
ASSIGNEE(S)		DATE REGISTERED			
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FULL NAME(S) OF INVENTOR(S)					
72	JAN PETRUS HUMAN				
PRIORITY CLAIMED		COUNTRY		NUMBER	
		33	—	31	—
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TITLE OF INVENTION					
54	TAMPER EVIDENT CLOSURE				
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74					
PATENT OF ADDITION TO NO.		DATE OF ANY CHANGE			
61					
FRESH APPLICATION BASED ON		DATE OF ANY CHANGE			

REPUBLIC OF SOUTH AFRICA

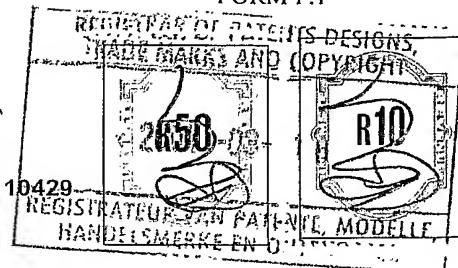
PATENTS ACT, 1978

APPLICATION FOR A PATENT AND ACKNOWLEDGMENT OF RECEIPT  
(Section 30(1) Regulation 22)

THE GRANT OF A PATENT IS HEREBY REQUESTED BY THE UNDERMENTIONED APPLICANT  
ON THE BASIS OF THE PRESENT APPLICATION FILED IN DUPLICATE

21 01 OFFICIAL APPLICATION NO • 2004 / 1930

BB REF:



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54 TITLE OF INVENTION

TAMPER EVIDENT CLOSURE

THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2.  
(COUNTRY) (DATE) (NO.)

21 01 THE APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO

21 01 THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND BASED ON APPLICATION NO

THIS APPLICATION IS ACCCOMPANIED BY:

- 1. A single copy of a provisional or two copies of a complete specification of 8 pages
- 2. Drawings of 8 sheets
- 3. Publication particulars and abstract (Form P.8 in duplicate).
- 4. A copy of Figure of the drawings (if any) for the abstract.
- 5. An assignment of invention
- 6. Certified priority document(s). (State number)
- 7. Translation of the priority document(s)
- 8. An assignment of priority rights
- 9. A copy of Form P.2 and the specification of RSA Patent Application No
- 10. Form P.2 in duplicate
- 11. A declaration and power of attorney on Form P.3
- 12. Request for ante-dating on Form P.4
- 13. Request for classification on Form P.9
- 14.

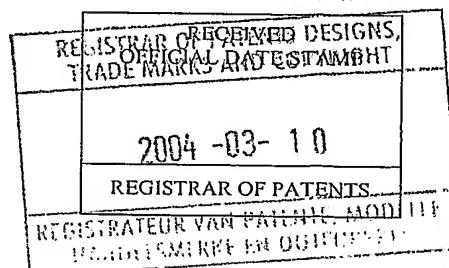
74 ADDRESS FOR SERVICE: Brian Bacon & Associates  
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DATED THIS 9<sup>th</sup> DAY OF March 2004

BRIAN BACON & ASSOCIATES

APPLICANTS PATENT ATTORNEYS

The duplicate will be returned to the applicant's address for service as  
proof of lodgment but is not valid unless endorsed with official stamp



REPUBLIC OF SOUTH AFRICA  
Patents Act, 1978

## PROVISIONAL SPECIFICATION

(Section 30 (1) – Regulation 27)

21	01	OFFICIAL APPLICATION NO
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22	LODGING DATE
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2004-03-10

2004/1930

71	FULL NAME(S) OF APPLICANT(S)
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JAN PETRUS HUMAN

72	FULL NAME(S) OF INVENTOR(S)
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JAN PETRUS HUMAN

54	TITLE OF INVENTION
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TAMPER EVIDENT CLOSURE

FIELD OF THE INVENTION

THIS INVENTION relates to tamper evident closures.

BACKGROUND TO THE INVENTION

In attempting to provide a tamper evident closure the approach generally taken is to provide a cap which is broken as it is taken off the container to which it was fitted. The most basic form of tamper evident cap has a transverse end wall and a skirt, the free edge portion of the skirt being in the form of a ring which is joined to the remainder of the skirt along a line of weakening. The ring itself can have a line of weakening across it. A bead on the container splits the ring, or the skirt breaks along the line of weakening separating the ring from the remainder of the skirt.

Within the ring there are normally protrusions which fit under the container's bead. It is these, in attempting to spread out when they are pulled against the bead during opening, that exert sufficient resistance to axial movement to break the cap.

In my prior South African Patent Applications 2003/9654 and 2004/0618, I disclose tamper evident closures which overcome the shortcomings discussed above. The present invention further improves the structures of my two earlier applications.

BRIEF DESCRIPTION OF THE INVENTION

According to one aspect of the present invention there is provided a tamper evident closure comprising a container part and a cap part, one of said parts being moulded using heat shrinkable synthetic plastics material and including a cylindrical band, the diameter of the band decreasing when it is heated whereby the band grips the other of said parts.

In one form said one part is a container having a flange encircling it, the band protruding from the flange and defining, with the flange and the container neck, a trough which the free edge portion of the skirt of a cap enters as the cap is fitted to the container.

The neck is preferably externally screw threaded, the threading extending into said trough. The preferred material for the container is PET.

The band can be secured to the flange along a continuous join line. Alternatively the join line between the band and the flange can be discontinuous and comprise a circumferentially extending array of bridges joining the band and flange, there being openings in the band between the bridges.

Even if the band is not shrunk, the limited access to the ring prevents the cap being turned as a unit so that it comes off the container without breaking.

The band and flange can be separate from the remainder of the

5 preform and can be in the form of a sleeve which is fitted around the remainder of the preform.

10 Said cap can comprise a transverse end wall and a skirt. The skirt can have therein a line of weakening along which the main part of the skirt is joined to a ring forming the free edge portion of the skirt, said ring, said line of weakening and the portion of said main part of the skirt adjacent the line of weakening being in said trough once the cap has been fitted to the container.

15 The band can have external ribs extending in the direction from said line of weakening to the free edge of the band. Said ribs preferably extend between said line and said edge.

20 In another form said cap is part of heat shrinkable material and includes a skirt with a line of weakening extending around it which divides the skirt into a main part and a band which forms the edge zone of the skirt, said band decreasing in diameter and gripping the container part when the band is heated.

25 BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:-

Figure 1 is a pictorial view showing a preform and a cap;

Figure 2 is an axial section showing a preform with a cap screwed onto it;

5 Figure 3 is a pictorial view of the cap and preform of Figures 1 and 2 with a portion cut away;

Figure 4 is a section showing the preform and cap of Figures 1 to 3 after heat treatment;

Figure 5 illustrates a further form of cap and preform;

10 Figure 6 is a section showing the cap and preform of Figure 5 before heat treatment;

Figures 7A, 7B and 7C respectively illustrate a sleeve, a preform and the sleeve fitted to the preform; and

15 Figure 8 illustrates a further tamper evident closure.

#### DETAILED DESCRIPTION OF THE DRAWINGS

15 Referring firstly to Figures 1 to 4, the cap 10 shown has a transverse end wall 12 and a cylindrical skirt designated 14. The skirt comprises a main part 16 and a subsidiary part in the form of a ring 18. The ring 18 is joined to the skirt part 16 by way of a series of bridges 20. There are openings 22 between adjacent bridges. The bridges and openings form a line of weakening extending around the skirt.

20 The ring 18 has a series of ribs 24 on its outer surface, the ribs extending from the line of weakening to the free edge of the skirt. As best seen in Figure 2, the ring 18 flares outwardly from the line of weakening to its free edge.

Figure 1 also illustrates a PET preform 26 from which a bottle can be blown. The preform has a flange 28 and a band 30 is moulded integrally with the flange. As best seen in Figure 2, the band 30 is cylindrical in form and, in section, is thinner than the flange 28.

5 In Figures 2, 3 and 4 of the drawings, the cap 10 is shown screwed onto the preform 26. This is purely to illustrate the relationship between the cap and the preform and it will be understood that in practice the cap is only screwed on after the preform has been blown into the form of a bottle.

10 When the cap is screwed onto the bottle blown from the preform, the edge of the skirt 14 enters the annular gap bounded by the band 30 and the part of the neck of the bottle above the flange 28 (see particularly Figure 2).

15 On heating of the band, it shrinks onto the skirt (see Figure 4) both above and below the bridges 20 and openings 22 thereby firmly securing the skirt to the blown bottle. The ring 18 is completely inaccessible as it is entirely covered by the band 30. Unscrewing of the cap 10 causes the cap to break along the line of weakening constituted by the bridges 20 and openings 22.

20 In Figures 5 and 6 there is shown a cap 10 which does not have ribs 24 or the line of weakening constituted by the bridges 20 and openings 22. The preform of these Figures differs from that described above in that the band 30 is not connected to the flange 28 along a continuous line but by a series of bridges 32.

1 The bridges 32 have gaps 34 between them. The connection between the band 30  
and the flange 28 is thus weakened with respect to the connection shown in Figures  
1 to 4.

5 The edge of the skirt 14 enters the gap between the neck of the  
preform and the band 30 as the cap is screwed on. When the band 30 is heated, it  
shrinks onto the ring 18 and grips it tightly as described above.

10 Upon turning of the cap to unscrew it, the band 30 of the preform  
breaks off along the line of weakening where it is joined to the flange 28. The band  
30 is thus removed from the blown bottle with the cap 10.

15 It will be understood that in the embodiment of Figures 5 and 6 the cap  
does not have any weakened zones along which it can break. Thus it is the preform  
which fails when sufficient force is applied to the cap to rotate it and cause initial  
axial movement.

15 In Figures 7A, 7B and 7C the same reference numerals as are used  
above have been employed where applicable.

The sleeve shown in Figure 7A is designated 36. The sleeve 36  
comprises the flange 28 and the band 30. The sleeve 36 is slipped over the preform  
from above or from below, and is shrunk onto the preform. The resultant  
combination of preform 38 and sleeve 36 is thus of the same configuration as the

7a

as the preform 26 of Figures 1 to 6.

The band 30 in all forms of closure described herein can be stretched by a part of the tool during mould opening thereby to impart shrinkability. Alternatively, in the form described hereinafter with reference to Figure 8, the band can be stretched during blow moulding thereby imparting the requisite heat shrink capability to it.

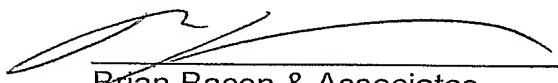
~~preform 26 of Figures 1 to 6.~~

In Figure 8 the cap designated 40 has a transverse end wall 42 and a skirt 44. The skirt 44 has a line of weakening 46 around it which divides it into a main portion 48 and a ring 50. Inside the ring 50 there are protruding flags 52 which fit under a bead 54 on the preform 26.

The band 30 extends upwardly to a level above the line 46 and, even if the band 30 is not shrunk, access to the ring 50 is prevented by ensuring that the ring 50 is a tight fit between the band 30 and the neck. Further security is provided by shrinking the band.

10 The flange 28 and band 30 can if desired be part of a loose sleeve of the type shown at 36 in Figure 7A.

Dated this 9<sup>th</sup> day of March 2004



15 Brian Bacon & Associates  
Applicant's Patent Attorney

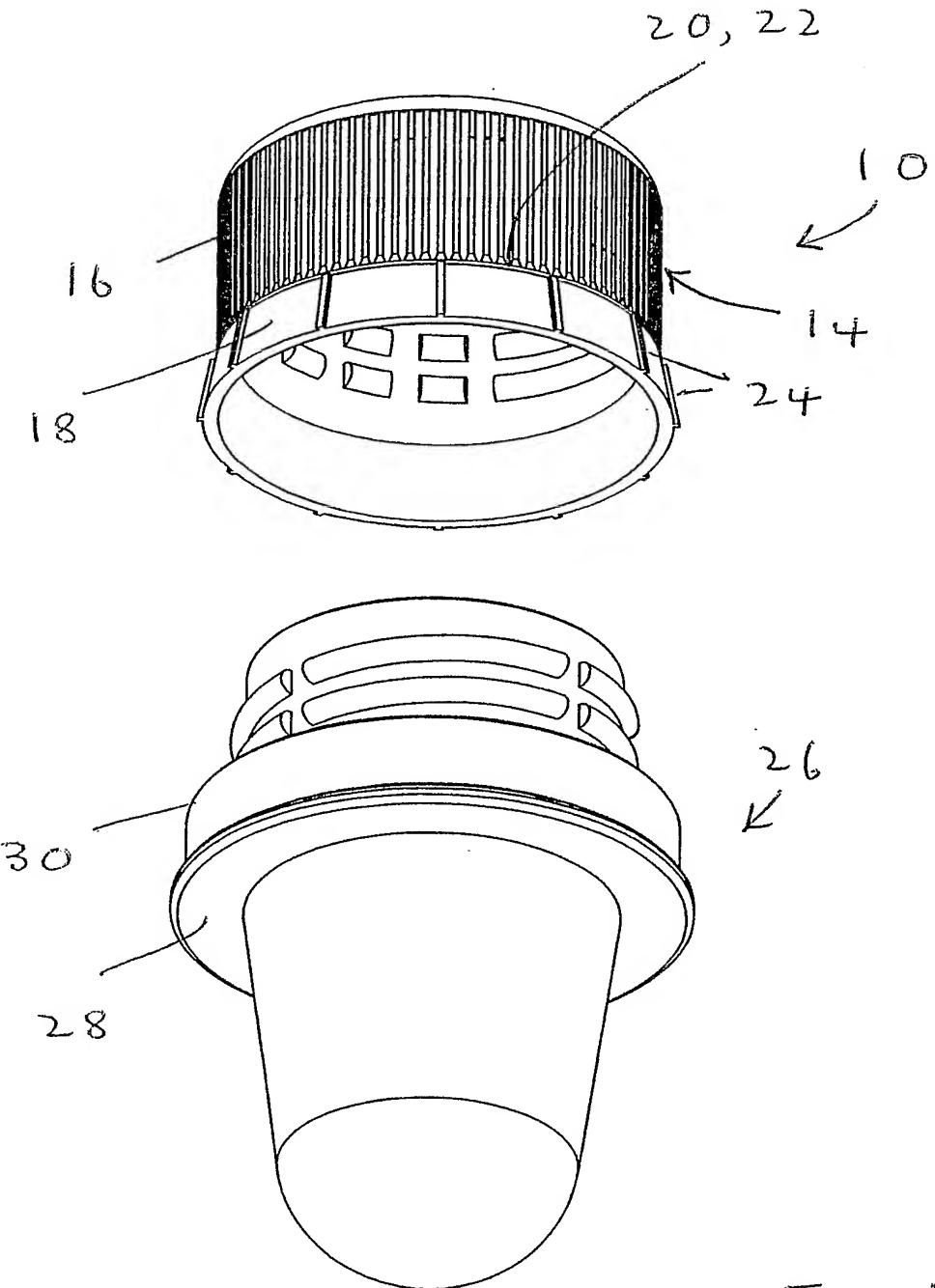


Fig. 1

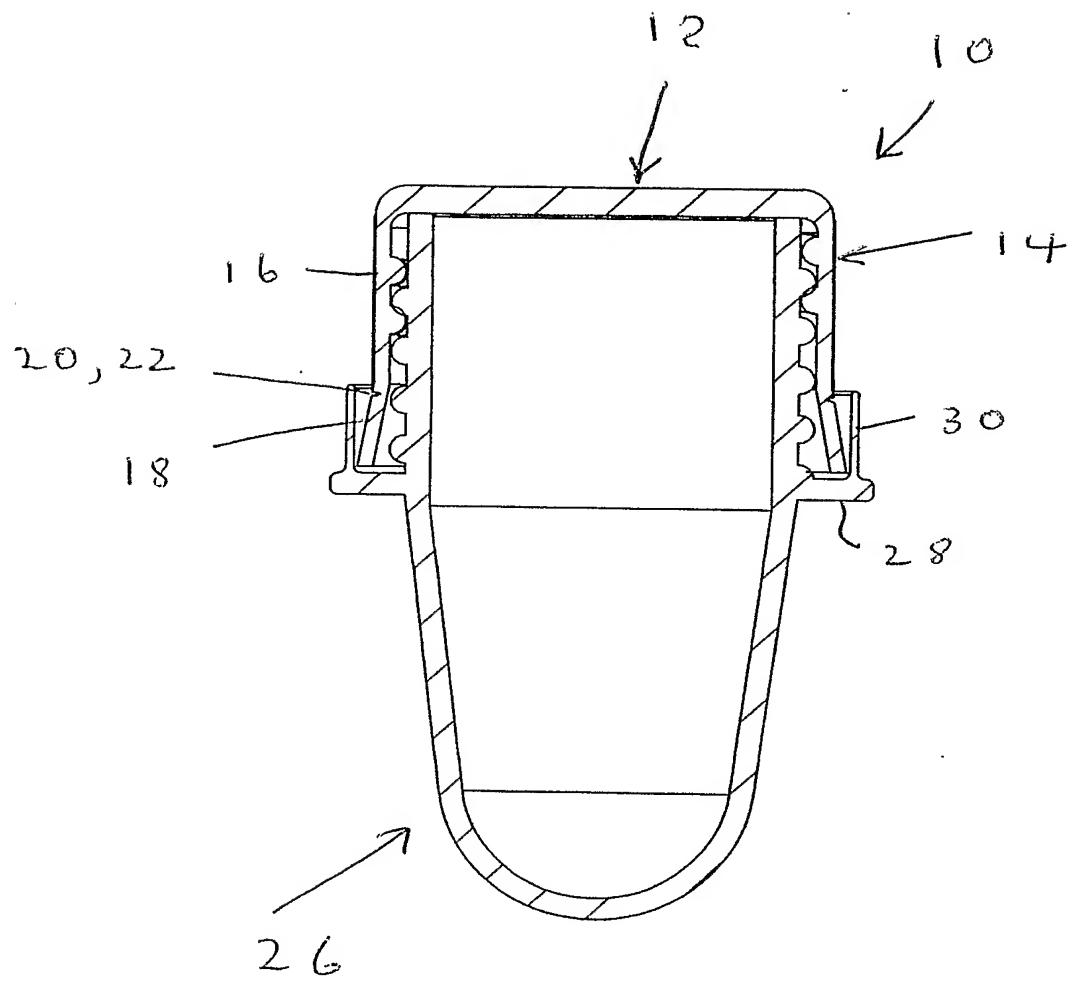


Fig. 2

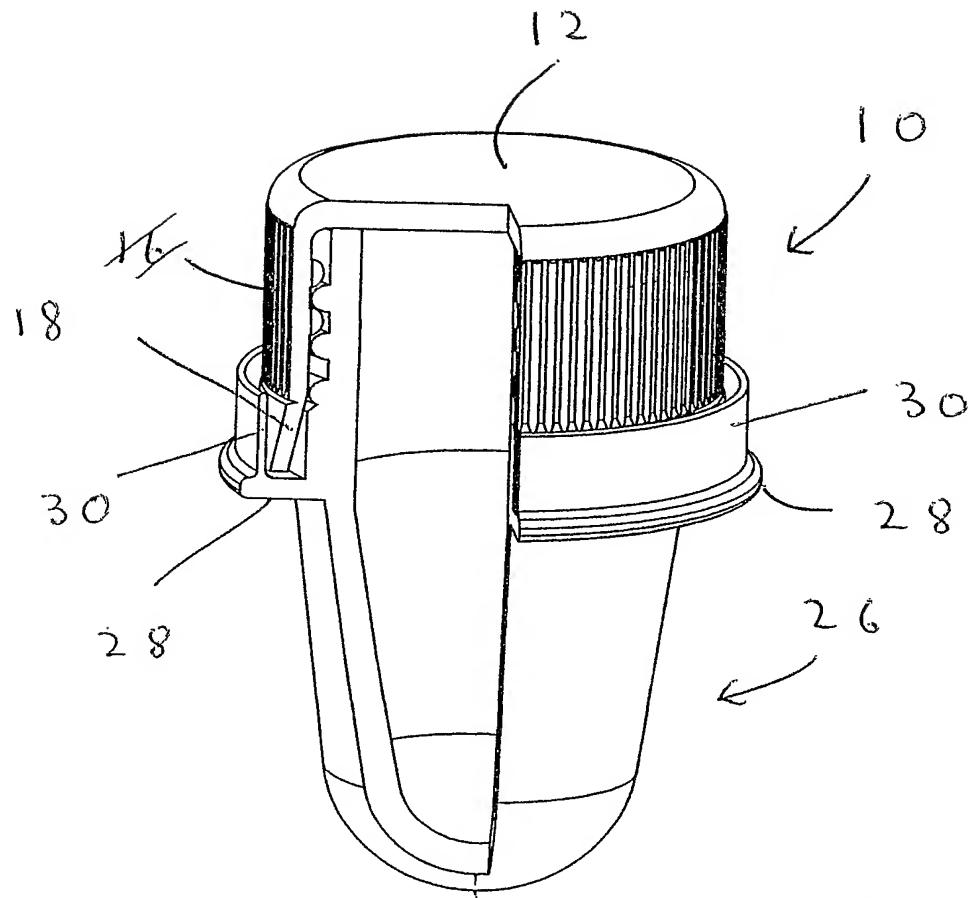


Fig. 3



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8 Sheets

Sheet No.4

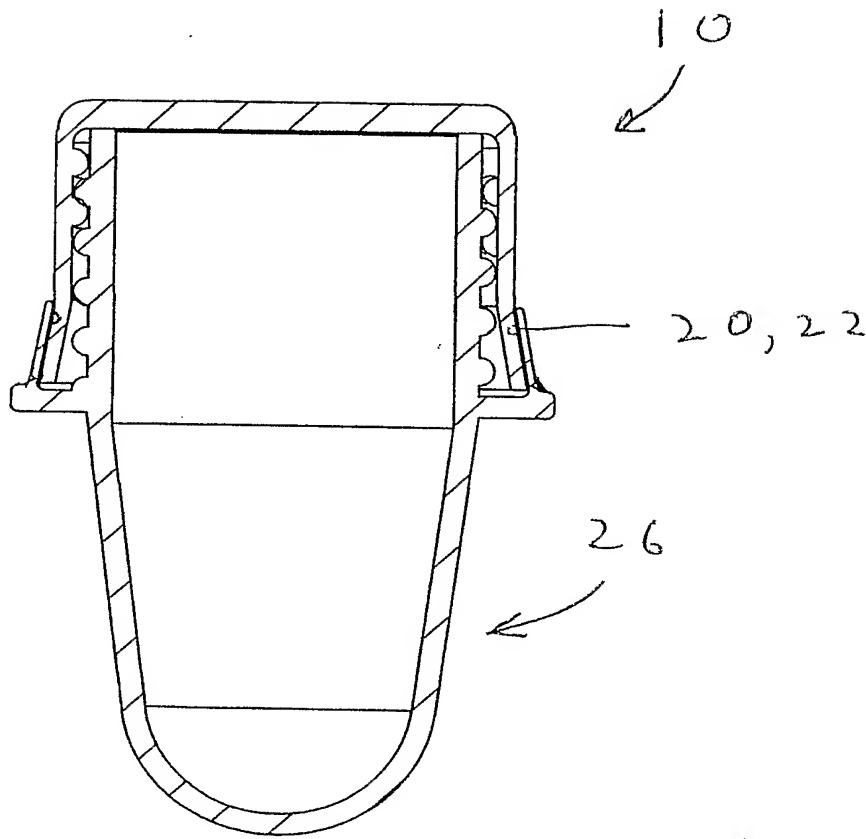
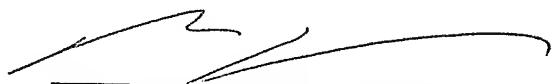


Fig. 4

  
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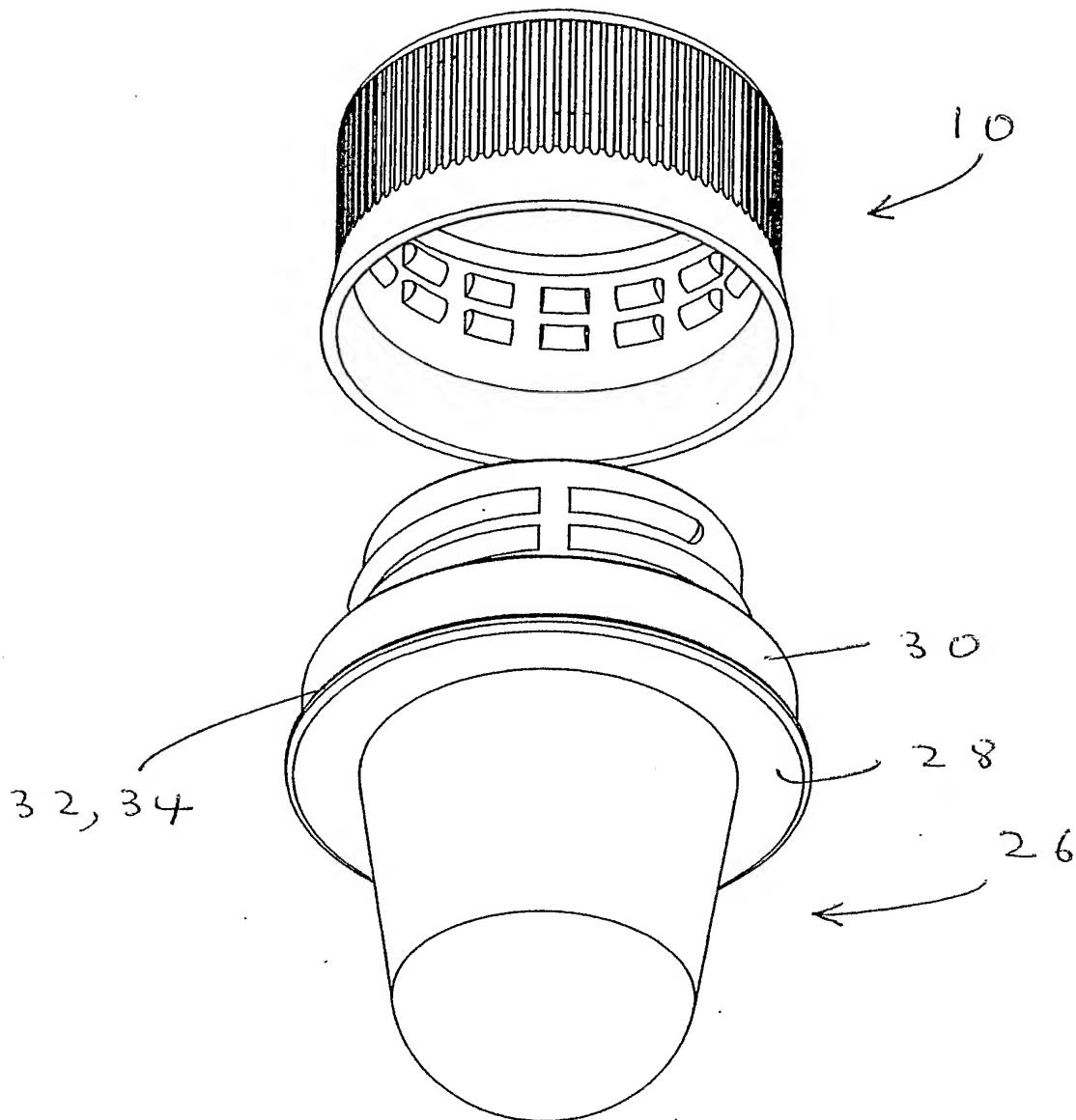


Fig. 5



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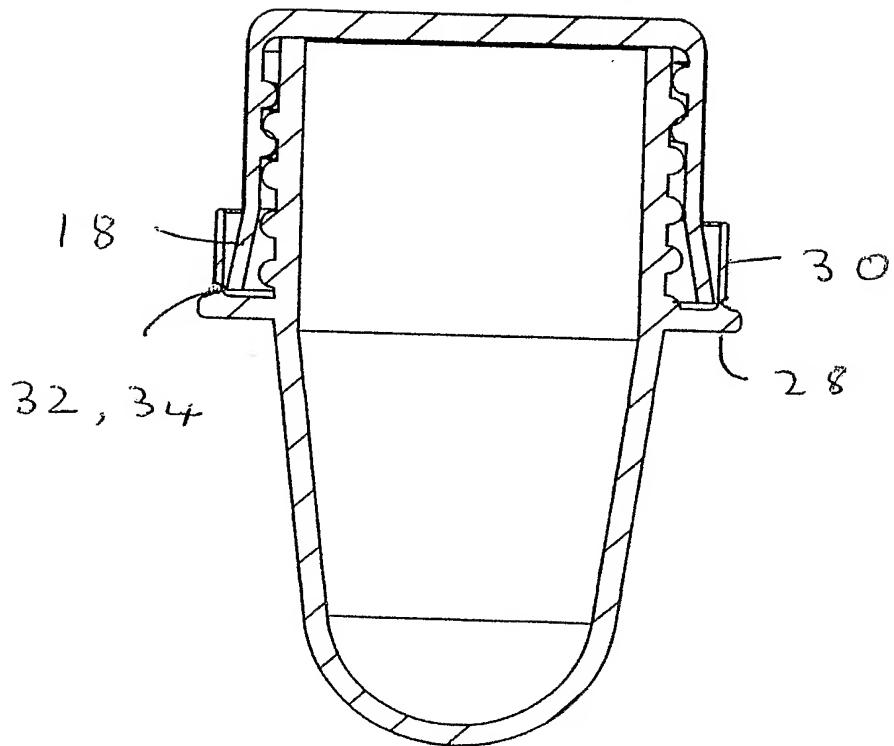


Fig. 6

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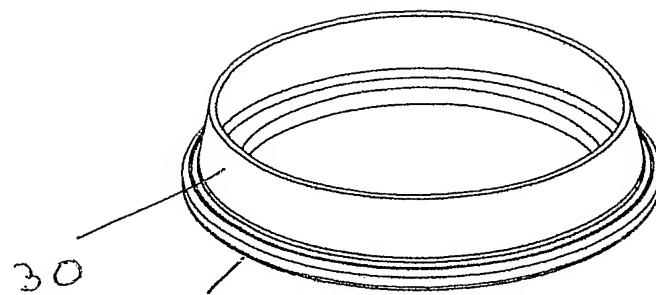


Fig. 7 A

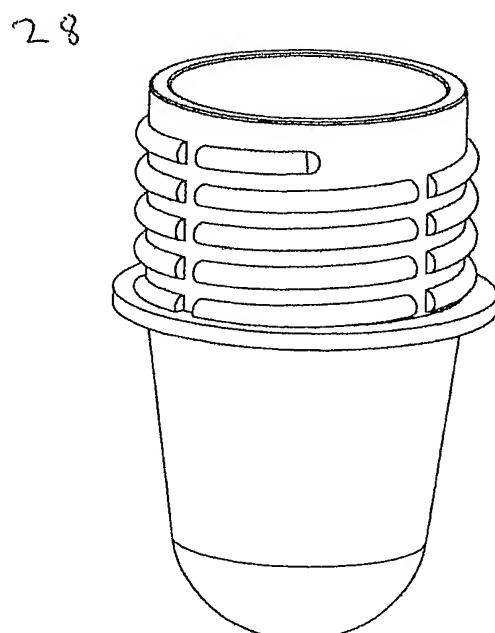


Fig. 7 B

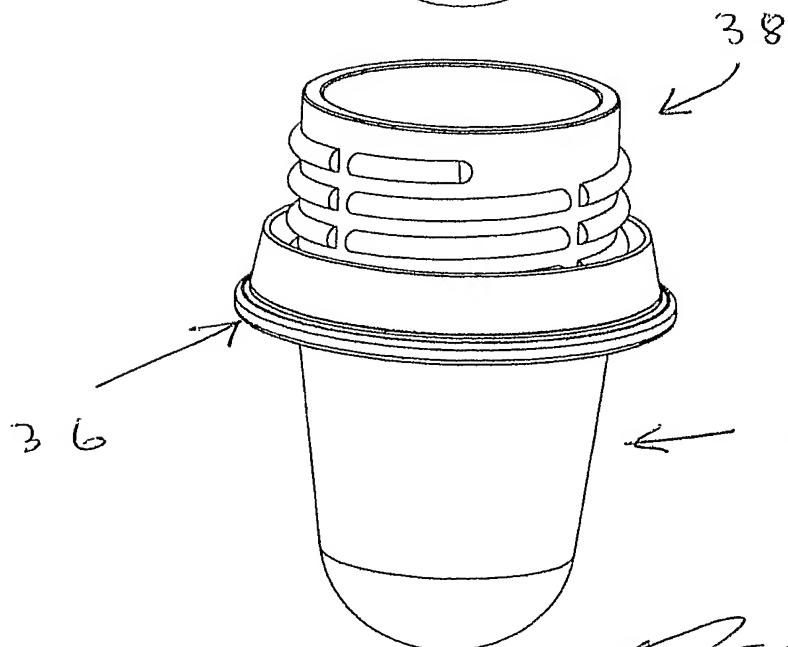
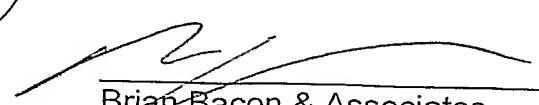


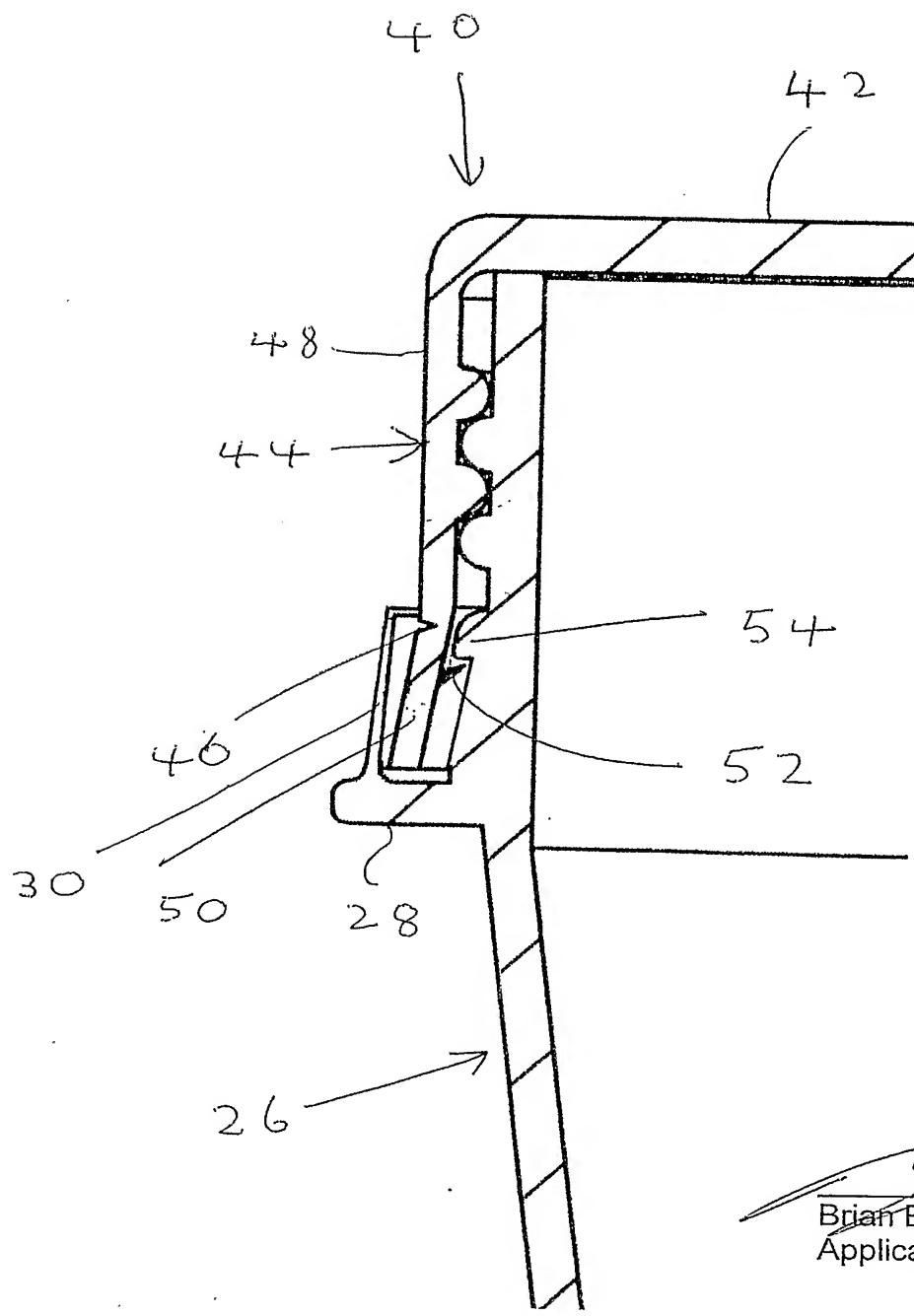
Fig. 7 C

  
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